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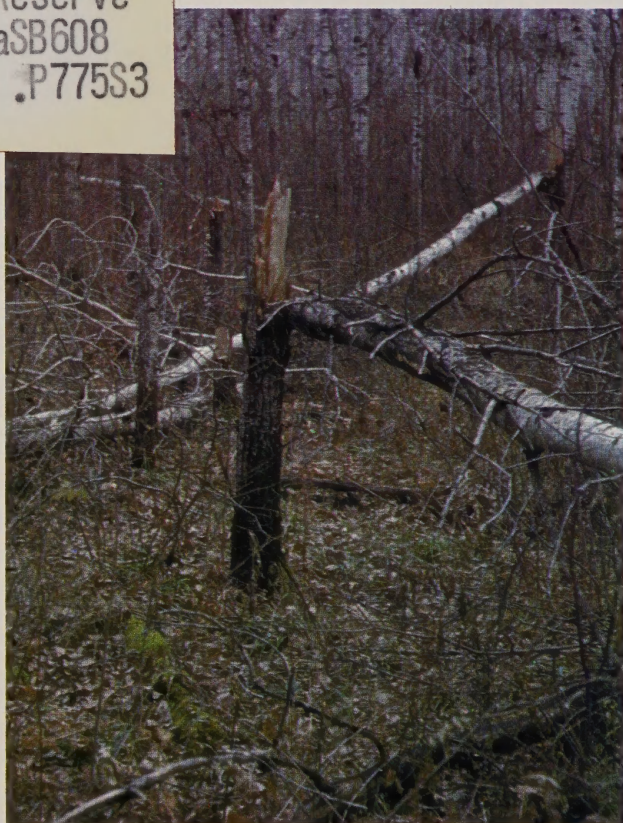
# HOW TO Identify Hypoxylon Canker of Aspen

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Hypoxylon canker (caused by the fungus **Hypoxylon mammatum**) infects about 12 percent of all quaking aspen in Michigan, Minnesota, and Wisconsin. It kills 1 to 2 percent of the standing aspen volume (112 million board feet) each year by girdling the trees. Pole-size trees succumb in 3 to 7 years; younger ones may be killed more quickly. Decay fungi enter the trees through the cankers and weaken the stems, subjecting them to windthrow.

No chemical controls are available to prevent Hypoxylon canker but proper management of aspen can minimize losses to the disease.

## IDENTIFICATION

Symptoms vary with the different stages of canker development.

### Initial Stage

**Look for: Yellowish-orange areas on the bark.** Any size tree may be infected. Cankering is commonly associated with dead branches.





### Two Years After Infection

**Look for: Blistering of the bark.** The outer layer of bark in the oldest part of the canker will loosen and appear to blister.



**Look for: Gray pillars under the blistered bark.** Asexual conidia are formed on these pillars, which are diagnostic for Hypoxylon canker.



### Three Years After Infection

**Look for: Small patches of hard, gray, raised structures.** These sexual fruiting structures (perithecia) appear where the conidial pillars were the previous year, and darken with age. The more recently cankered bark surrounding the perithecial area appears to be blistered because of the new conidial pillars.



**Look for: A white mycelial fan under the bark at edge of canker.** Although such a fan is not proof that the canker is caused by *Hypoxylon mammatum*, it is a useful means of tentative identification before pillars or perithecia develop.







## CULTURING

To culture the fungus, place ascospores or small wood chips from the edge of a canker on an appropriate medium. A culture of **Hypoxylon mammatum** on 2 percent malt agar is typically white with occasional gray patches and an irregular margin.

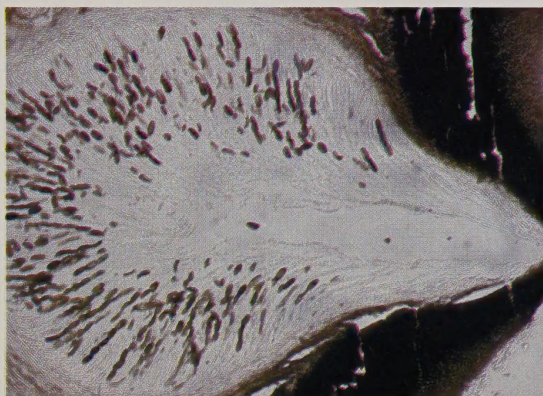


## MICROSCOPIC CHARACTERISTICS

Although the conidia and ascospores are produced in abundance, they have not been shown to cause new cankers.

### Perithecia

The dark brown to black sexual ascospores can be seen by carefully sectioning the perithecia or moistening them and placing over a glass plate.



### Conidia

The conidia are one-celled, ovoid to oblong in shape, and hyaline. A typical conidium is shown in the photomicrograph of a conidial pillar.



## SILVICULTURAL MANAGEMENT

As yet, Hypoxylon canker cannot be prevented, but certain silvicultural techniques can minimize its impact.

The canker is favored by stand openings and by poor stocking, so maintaining a dense stand and a closed canopy will reduce its occurrence.

Check all aspen stands routinely for the disease.

- If 15 to 25 percent of the trees are infected, harvest the stand early and treat the site to encourage good aspen reproduction.
- If more than 25 percent of the trees are infected, harvest immediately and convert to other species. (Susceptibility varies by clone and very susceptible clones should not be perpetuated.)
- Lightly infected stands can be managed on rotations longer than 40 years.

If 30 to 40 thousand new stems per acre are produced after cutting or burning, the stand can suffer up to 7.5 percent mortality per year from Hypoxylon and other causes and still yield 1,500 harvestable stems per acre at 40 years.

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